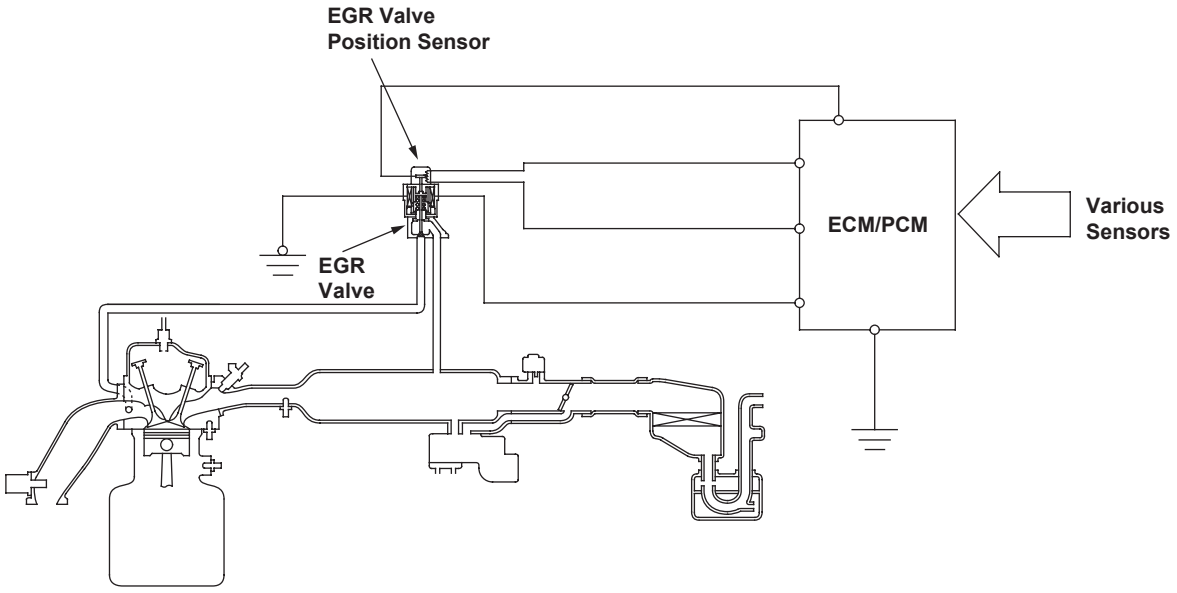
Advanced Diagnostics

DTC P0401: Exhaust Gas Recirculation (EGR) Insufficient Flow



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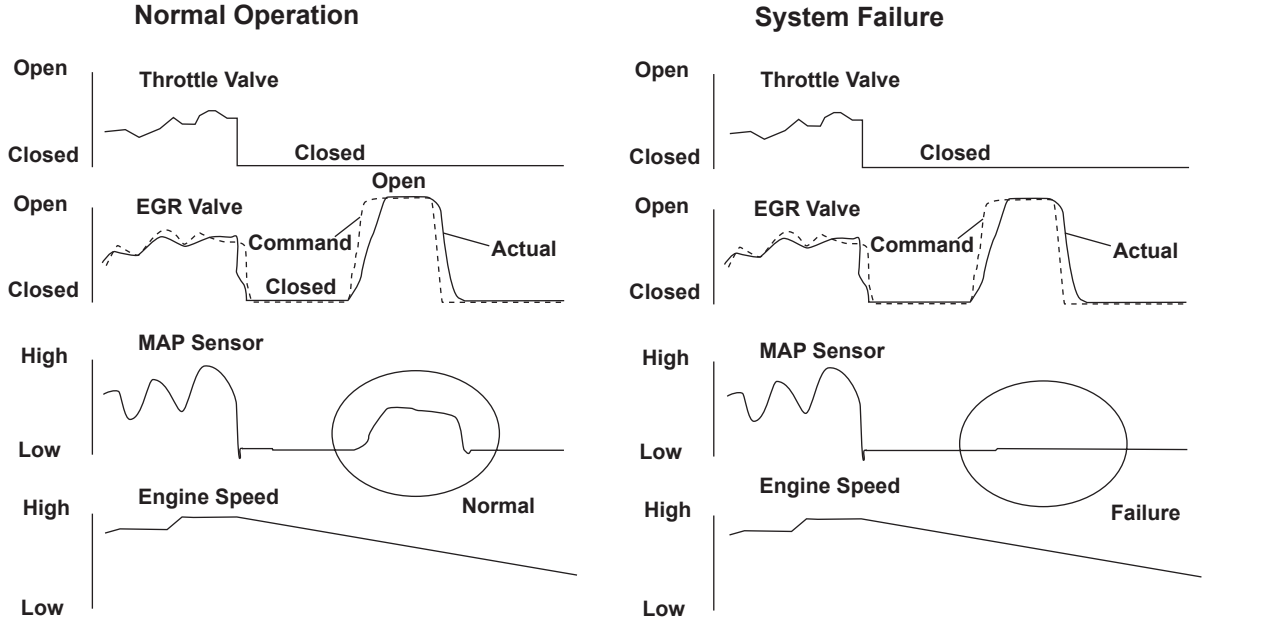

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General Description

The exhaust gas recirculation (EGR) system reduces oxides of nitrogen (NOx). NOx is generated by high combustion temperatures. The EGR system lowers peak combustion temperatures by recirculating exhaust gas into the air/fuel mixture, thus reducing NOx. The manifold absolute pressure (MAP) sensor detects the intake manifold pressure (vacuum) and the engine control module (ECM)/powertrain control module (PCM) determines if the amount of exhaust gas recirculation is sufficient. When starting to decelerate with the throttle valve closed, the EGR valve is closed. If the intake manifold pressure changes only slightly while the EGR valve opens fully and closes again within a specified time period, a malfunction is detected and a DTC is stored.

Monitor Execution, Sequence, Duration, DTC Type

Execution	Once per driving cycle
Sequence	"EGR valve insufficient lift" is OK
Duration	4 seconds or more
DTC Type	Two drive cycles, MIL ON

Enable Conditions

Condition	Minimum	Maximum
Engine coolant temperature	167ºF (75ºC)	—
Engine speed	1,200 rpm	2,500 rpm
MAP value	13 kPa (94 mmHg, 3.8 in.Hg)	—
Vehicle speed	26 mph (41 km/h)	—
Battery voltage	10.6 V	—
Throttle position	Fully closed	
Fuel feedback	During fuel cut-off operation for deceleration	
No active DTCs	ECM/PCM*1, MAP, CKP, ECT, TP, EGR, BARO, IAC, VSS	
Other	Test-drive on a flat road to avoid misdetection	

*1: F23A1, F23A5 engines

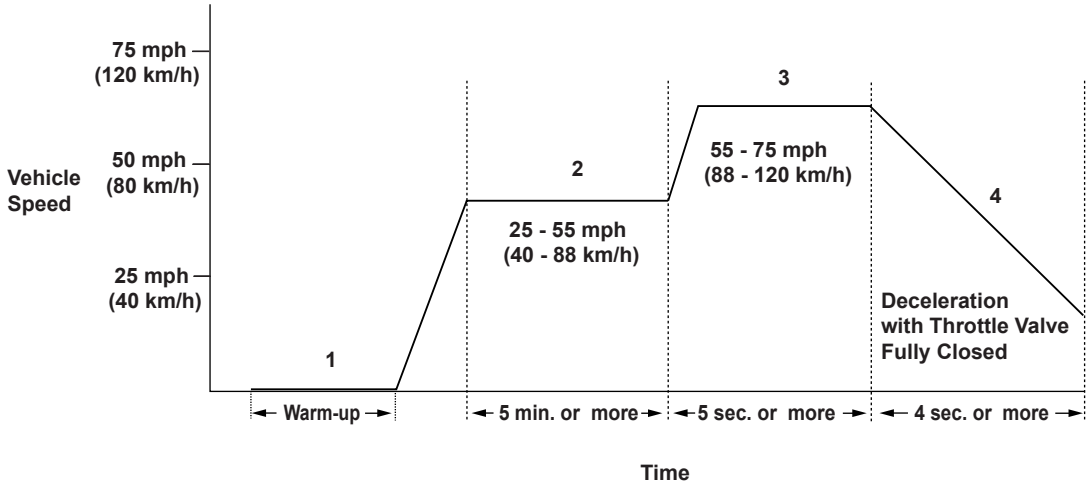
Malfunction Threshold

- The MAP sensor output changes by 3 kPa (29 mmHg, 1.1 in.Hg)*2, *4, 4 kPa (30 mmHg, 1.1 in.Hg)*3 or less at an engine speed of 1,200 rpm or 1 kPa (14 mmHg, 0.5 in.Hg) or less at an engine speed of 2,500 rpm when the atmospheric pressure is 101 kPa (760 mmHg, 29.9 in.Hg).
- The MAP sensor output changes by 2 kPa (18 mmHg, 0.7 in.Hg) or less at an engine speed of 1,200 rpm or 1 kPa (8 mmHg, 0.3 in.Hg)*2, *3, 1 kPa (9 mmHg, 0.3 in.Hg)*4 or less at an engine speed of 2,500 rpm when the atmospheric pressure is 61 kPa (459 mmHg, 18.0 in.Hg).

Either state of the aforementioned lasts for at least 4 seconds.

*2: F23A1 engine
*3: F23A5 engine
*4: F23A4 engine

Driving Pattern



P0401-0050

1. Start the engine. Hold the engine at 3,000 rpm with no load (in park or neutral) until the radiator fan comes on.
2. Drive the vehicle at a speed between 25 - 55 mph (40 - 88 km/h) for at least 5 minutes.
3. Then, drive at a steady speed between 55 - 75 mph (88 - 120 km/h) for at least 5 seconds.
4. Hold the throttle valve fully closed for at least 4 seconds.

- If you have difficulty duplicating the DTC, retest after turning off electrical components such as the audio system and A/C, and try a different gear position.
- Drive the vehicle in this manner only if the traffic regulations and ambient conditions allow.

Diagnosis Details

Conditions for illuminating the MIL

When a malfunction is detected during the first drive cycle, a Temporary DTC is stored in the ECM/PCM memory. If the malfunction recurs during the next (second) drive cycle, the MIL comes on and the DTC and the freeze frame data are stored.

Conditions for clearing the MIL

The MIL will be cleared if the malfunction does not recur during three consecutive trips in which the diagnostic runs.
The MIL, the DTC, the Temporary DTC, and the freeze frame data can be cleared by using the scan tool Clear command or by disconnecting the battery.